



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/681,861	06/19/2001	Mathew L. Sommers	GLO 2 0054	7250
27885	7590	01/07/2004		
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114				
			EXAMINER HARPER, HOLLY R	
			ART UNIT	PAPER NUMBER

2879

DATE MAILED: 01/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/681,861	Applicant(s) SOMMERS, MATHEW L.	
	Examiner Holly R. Harper	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-15, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6, 8, 10-15, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (USPN 5,998,925) in view of Miller (USPN 6,044,189).

In regard to claim 1, the Shimizu reference discloses a light-emitting device comprised of a nitride compound semiconductor (Column 3, Lines 26-27) providing blue emission (Column 4, Line 64). A coating material made of phosphor and epoxy is used to surround the nitride compound (Column 16, Lines 54-60 and Figure 1). It is a property of phosphor materials that a portion of the emission light is absorbed by the phosphor. The Shimizu reference does not specify that the frame has a roughened portion in contact with the epoxy. The Miller reference teaches that when using an epoxy a rough or textured surface improves adhesion (Column 5, Lines 9-12). It is well known in the art that ridges, grooves, or dimples are a common way of providing roughness on a surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a rough surface on the part of the frame contacting the epoxy, as taught by Miller, to improve adhesion.

It is elementary that mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. Thus, the functional limitation of the roughened surface facilitating a redirection of an unabsorbed emission backward onto the phosphor is taught by Shimizu under the principles of functional inherency.

In regard to claims 2-4, the Shimizu reference discloses that the nitride compound contains GaN (Column 4, Line 53), a binary compound in group III.

In regard to claim 5, the Shimizu reference discloses that a GaN compound semiconductor is made by forming a layer of InGaN on a substrate (Column 13, Line 60). This is surrounded by the epoxy (Figure 1).

In regard to claim 6, the Shimizu reference discloses that the use of a sapphire substrate is preferable (Column 14, Lines 9-10).

In regard to claim 8, the Shimizu reference discloses that the fluorescent material absorbs light of a short wavelength (blue light) and emits light of a long wavelength (Column 6, Lines 20-24), meaning visible light.

In regard to claims 10 and 11, the Shimizu reference discloses a light-emitting device comprised of a nitride compound semiconductor (Column 3, Lines 26-27) providing blue emission (Column 4, Line 64). A coating material made of phosphor and epoxy is used to

Art Unit: 2879

surround the nitride compound (Column 16, Lines 54-60 and Figure 1). The fluorescent material absorbs light of a short wavelength (blue light) and emits light of a long wavelength (Column 6, Lines 20-24), meaning visible light. The Shimizu reference does not specify that the frame has a rough portion in contact with the epoxy. The Miller reference teaches that when using an epoxy a rough or textured surface improves adhesion (Column 5, Lines 9-12). The roughened portion of the frame would increase the surface area in contact with the epoxy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a rough surface on the part of the frame contacting the epoxy, as taught by Miller, to improve adhesion.

It is elementary that mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. Thus, the functional limitation of the roughened surface facilitating a redirection of the unconverted first wavelengths backward into the phosphor is taught by Shimizu under the principles of functional inherency.

In regard to claim 12, the Shimizu reference discloses the use of a phosphor that has two ranges of wavelengths. The range of the short wavelength being absorbed is 400 to 500 nm (Figure 3A) and the range of the long wavelength being emitted is 450 nm to 700 nm (Figure 3B).

In regard to claim 13, the Shimizu reference discloses a light-emitting device comprised of a nitride compound semiconductor (Column 3, Lines 26-27) providing blue emission (Column 4, Line 64). A nitride compound semiconductor is made by forming a layer of InGaN on a substrate (Column 13, Line 60). A coating material made of phosphor and epoxy is used to surround the nitride compound and substrate (Column 16, Lines 54-60 and Figure 1). The frame includes an uneven surface (Figure 1, element 105). In the uneven part of the frame, the nitride compound, substrate, and epoxy are located.

In regard to claim 14, the Shimizu reference discloses that the nitride compound contains GaN (Column 4, Line 53), a binary compound.

In regard to claim 15, the Shimizu reference discloses that the use of a sapphire substrate is preferable (Column 14, Lines 9-10).

In regard to claim 22, the Miller reference teaches the use of a roughened surface when applying an epoxy. It is well known in the art that ridges, grooves, or dimples are a common way of providing roughness on a surface.

In regard to claim 23, the Shimizu reference discloses a light-emitting device comprised of a nitride compound semiconductor (Column 3, Lines 26-27) providing blue emission (Column 4, Line 64). A coating material made of phosphor and epoxy is used to surround the nitride compound (Column 16, Lines 54-60 and Figure 1). The epoxy (Figure 2, Element 201) is between the light emitting material (Figure 2, Element 202) and the frame (Figure 2, Element 204). The Shimizu reference does not specify that the frame has a roughened portion in contact with the epoxy. The Miller reference teaches that when using an epoxy a rough or textured surface improves adhesion (Column 5, Lines 9-12). It is well known in the art that ridges,

Art Unit: 2879

grooves, or dimples are a common way of providing roughness on a surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a rough surface on the part of the frame contacting the epoxy, as taught by Miller, to improve adhesion.

3. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Srivastava et al. (USPN 6,616,862 B2) in view of Miller (USPN 6,044,189).

In regard to claim 7, the Srivastava reference discloses an LED with a nitride compound for providing ultraviolet emission (Column 2, Lines 7-10), an epoxy embedded with a phosphor (Column 5, Lines 9-13), and a frame (Figure 3, Element 120). The Srivastava reference does not specify that the frame has a roughened portion in contact with the epoxy. The Miller reference teaches that when using an epoxy a rough or textured surface improves adhesion (Column 5, Lines 9-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a rough surface on the part of the frame contacting the epoxy, as taught by Miller, to improve adhesion.

Allowable Subject Matter

4. Claim 9 is allowed.

Regarding claim 9, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 9, and specifically comprising the limitation that the LED has a frame and a substrate where the nitride compound is mounted to one surface of the substrate and the epoxy with phosphor is mounted to the opposing surface of the substrate.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Harper whose telephone number is (703) 305-7908. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (703) 305-4794. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Application/Control Number: 09/681,861

Page 8

Art Unit: 2879

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Holly Harper
Patent Examiner
Art Unit 2879



NIMESHKUMAR D. PATEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800